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# PATENT SPECIFICATION



Application Date: Dec. 6, 1928. No. 35,979 / 28.

" " Jan. 14, 1929. No. 1205/29.

One Complete Left: Aug. 16, 1929.

Complete Accepted: March 6, 1930.

## PROVISIONAL SPECIFICATION.

No. 35,979, A.D. 1928.

### Improvements relating to Valves.

I, LESLIE HARRINGTON GROVES, of 17, Woodthorpe Road, Putney, London, S.W. 15, a British subject, do hereby declare the nature of this invention to be as follows:—

This invention relates to fluid valves which are controlled by the flow of another fluid, for example, to the gas valves of those automatic-lighting geysers where the full gas supply is turned on when a water tap associated with the geyser is turned on, the gas supply being automatically cut down when the water tap is turned off; and the nature of the invention will be particularly described with reference to such geyser valves, though it should be understood that the invention is not limited in this respect.

The invention has for its object to provide a simple and efficient valve which shall be capable of correctly operating without leakage and wear for very long periods.

The valve, according to the invention, includes a seating and a co-operating valve member connected for movement with a spindle disposed in a sleeve or bushing which extends into the interiors of passages for the two fluids (i.e. for the gas and water), the spindle being adapted to be rotated against a bias, to open the valve, when the water flow reaches a predetermined value. The spindle rotation may be effected by means of a crank arm carrying a plug adapted to rest on a seating transversely across the water pipe, a sufficient flow of water lifting the plug against a bias (which may be spring applied or due to gravity) as far as is necessary to rotate the spindle to open the gas valve; and on the flow of water falling below a predetermined value the spindle returns under the applied bias and allows the gas valve to close. The gas valve is preferably arranged so that, when closed the gas-pressure will assist in maintaining it closed.

A very important constructional feature [Price 1/-]

is the provision of a gas-tight valve, and, according to a further feature of the invention, the valve member is loosely or flexibly connected with a crank on the spindle and provided with a part-spherical face, the seating being correspondingly faced so that the part-spherical face will properly bed thereon when the valve member is in different angular positions. The part-spherical face may be concave or convex. By this flexible or loose connection the necessity for accurately centring the valve member with respect to its seating is avoided. Moreover, with a geyser valve of the kind referred to a certain amount of lost motion is desirable in order to ensure that the gas shall only be turned fully on when the flow of water has reached a predetermined minimum value. Additional means may be provided for biasing the valve member to closed position.

A preferred loose connection, according to a further feature of the invention, takes the form of a ball and out-sized socket. For example, the socket may be formed in the interior of the valve member, and the ball on the end of the crank, the crank passing into the interior of the socket through a small hole.

I prefer to dispose the spindle upon, and to connect it to, the lower-pressure side of the valve member, i.e. to the part-spherical face, so that the danger of gas leaking along the spindle through the bushing will be obviated, particularly in cases when the water is entirely drawn off from the water passage.

A further feature, according to the invention, involves the provision of a ball-and-socket or equivalent end thrust connection between the spindle and sleeve, and means biasing the ball and socket portions together. Conveniently the "water" end of the sleeve is opened out to form a half sphere or socket and a ball in the form of a swelling on the spindle biased thereinto by means of a spring

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sleeve is likewise split up into two aligned parts 24<sup>1</sup>, 24<sup>1</sup>, each secured in the facing partitions 13<sup>1</sup>, 13<sup>1</sup>. Crank 26 is connected with the associated spindle part in the manner described above in connection with Figs. 1 and 3 for the "gas" end of the spindle. Crank 29 is also shown connected with its associated spindle part 25<sup>1</sup> in a similar manner. On the other hand, each of the spindle parts, where it emerges from its associated sleeve, is provided with a plain end-thrust bearing 35<sup>1</sup>, 35<sup>1</sup> such as is illustrated at the "water" end of the spindle in Fig. 1.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A fluid-actuated fluid valve of the type hereinbefore set forth which is arranged so as to be biased to closed position by the pressure of the controlled fluid and which is connected on its lower-pressure side to an axially-rotatable actuating spindle extending into the interiors of passages for the fluids.

2. A fluid-actuated fluid valve, according to Claim 1, which seats on one side of an opening for the controlled fluid while the actuating spindle is disposed on the other side of the opening.

3. A fluid-actuated fluid valve of the type hereinbefore set forth having a part-spherical facing on its lower-pressure side adapted to co-operate with a correspondingly-shaped seating on one side of an opening for the controlled fluid, and an axially-rotatable actuating spindle for the valve which is disposed on the other side of the opening and extends between the fluid passages.

4. An arrangement, according to Claim 1, 2 or 3, in which the spindle is loosely connected to the valve through a ball and out-sized socket.

5. A fluid-actuated fluid valve of the type hereinbefore set forth which is arranged so as to be biased to closed position by the pressure of the controlled fluid and which is connected on its lower-pressure side to an actuating spindle disposed in a sleeve extending between the fluid passages and provided with an end-thrust ball-and-socket or equivalent bearing, between the spindle and sleeve, the elements of which are biased into contact.

6. A fluid-actuated fluid valve of the type hereinbefore set forth which is

arranged so as to be biased to closed position by the pressure of the controlled fluid and which is connected on its lower pressure side to an actuating spindle disposed in a sleeve extending between the fluid passages, opposed ball-and-socket or equivalent end-thrust bearings being provided between each end of the sleeve and the spindle, the respective elements of which bearings are spring biased into contact.

7. An arrangement according to Claim 6 in which a single spring biases the respective elements of both bearings.

8. In a fluid-actuated fluid valve of the type hereinbefore set forth which is arranged so as to be biased to closed position by the pressure of the controlled fluid, an end-thrust ball-and-socket or equivalent bearing between an actuating spindle, connected to the lower-pressure side of the valve, and one end of a sleeve therefor (the sleeve extending between the fluid passages) and another end-thrust ball-and-socket or equivalent bearing at the other end of the sleeve, this latter bearing including a bearing element which is axially slidable on but rotatable with the spindle, and a spring or the like disposed around the spindle and biasing the elements of the respective bearings into contact.

9. An arrangement according to Claim 8, wherein the bearing element slidable on the spindle is adapted to enclose the spring and is connected to the crank of the valve element or the actuating means as the case may be.

10. A modified form of fluid-actuated fluid valve, according to any preceding claim, and having an actuating spindle in two aligned parts coupled to rotate together, each part being disposed in a sleeve extending through the wall of the fluid passage with which it is associated, and each part having end-thrust bearings, the elements of which are biased into contact, between itself and the ends of the sleeve in which it is disposed.

11. A fluid-actuated fluid valve of the type hereinbefore set forth arranged substantially as hereinbefore described with reference to Figures 1 to 3, Figure 4, or Figure 5 of the drawings hereof.

Dated this 16th day of August, 1929.  
For the Applicant.

J. H. HARDMAN BROWN,  
Chartered Patent Agent.

19, Hertford Street, Coventry.

Fig. 1.

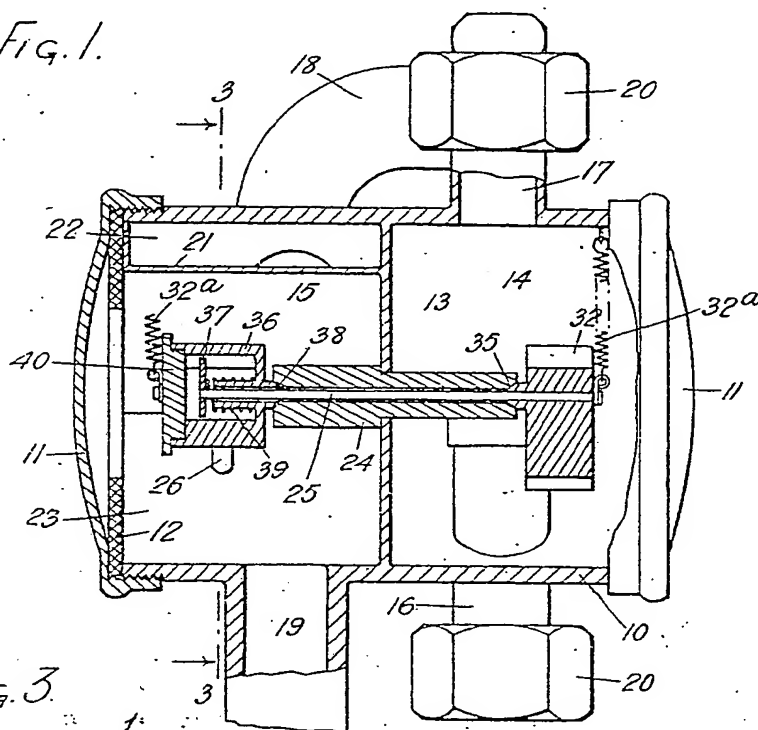


Fig. 3.

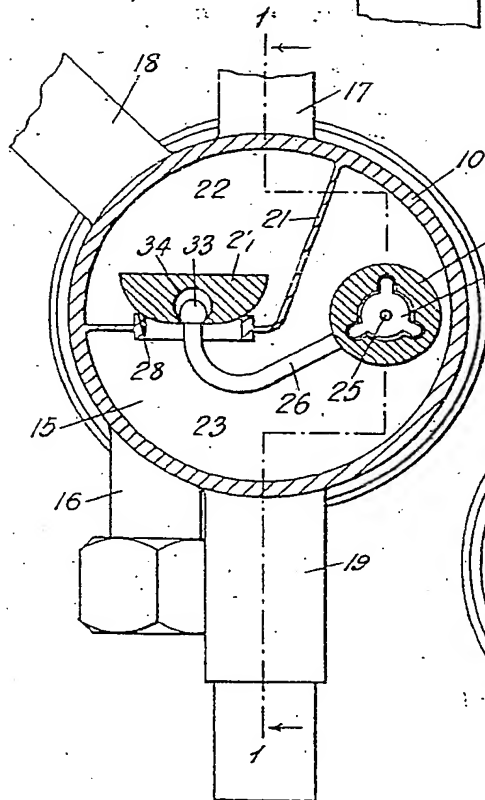
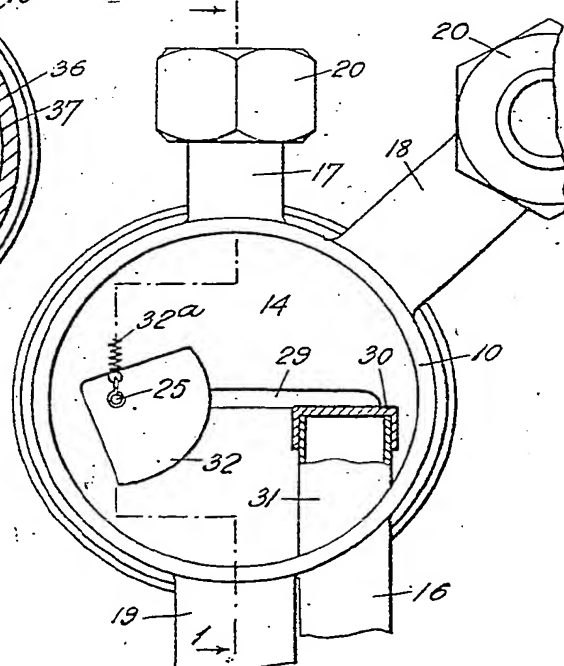


Fig. 2.



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Fig. 4.

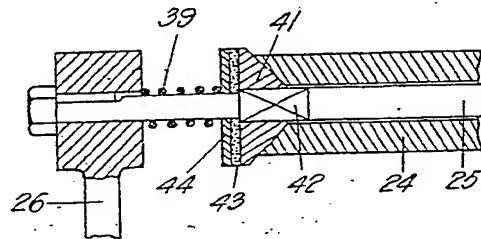
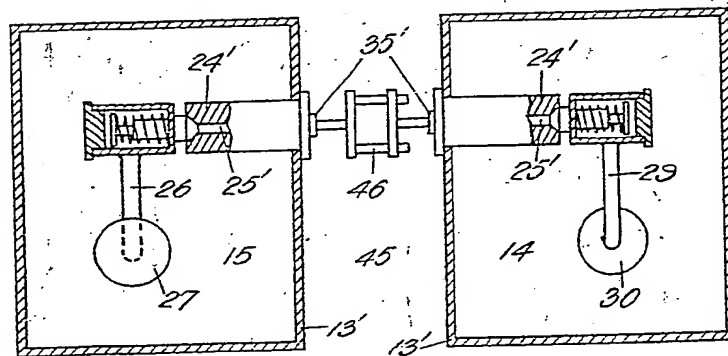


Fig. 5.



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Fig. 1.

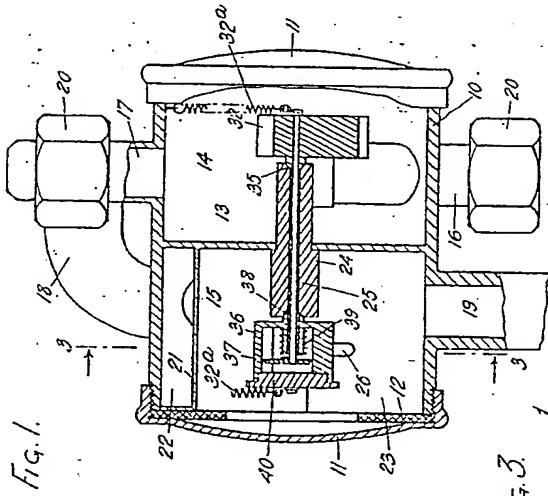


Fig. 3.

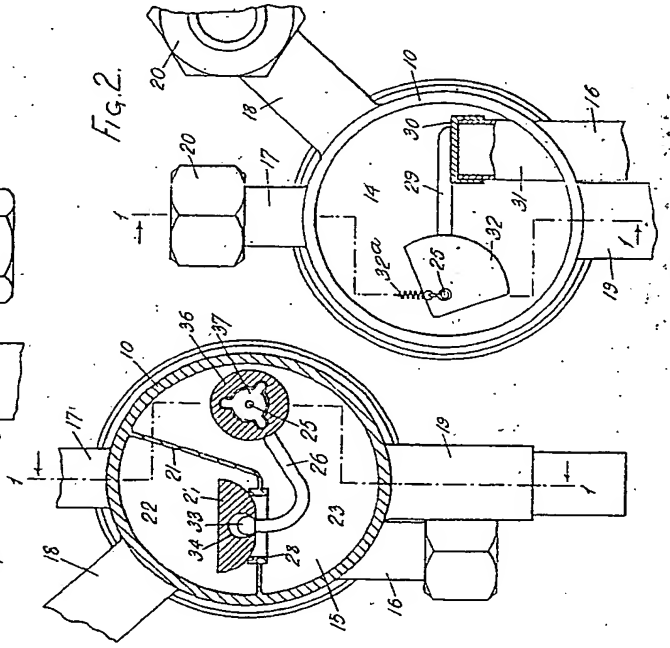
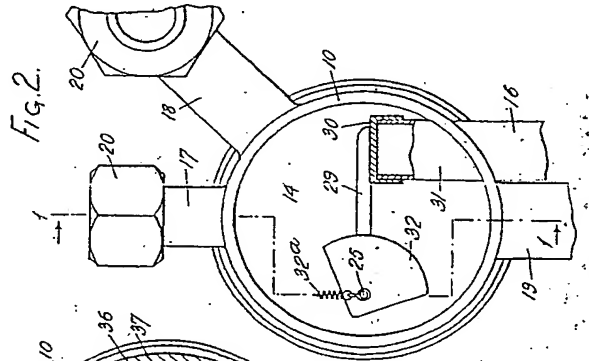


Fig. 2.



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Fig. 4.

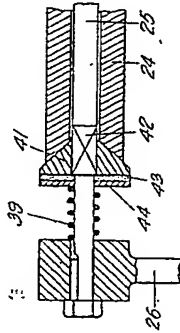
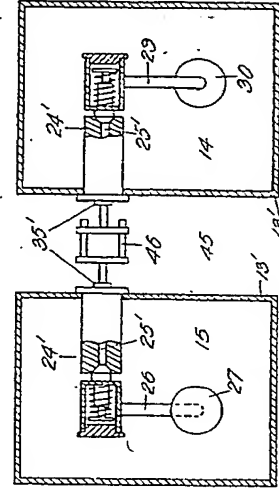


Fig. 5.



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